

THAT WHICH IS CLAIMED:

1. An isolated nucleotide molecule comprising a nucleotide sequence selected from the group consisting of:

- 5 (a) the nucleotide sequence set forth in SEQ ID NO: 1;
- (b) the nucleotide sequence set forth in SEQ ID NO: 3;
- (c) the nucleotide sequence set forth in SEQ ID NO: 5;
- (d) a nucleotide sequence comprising at least 70% sequence identity to the sequence set forth in SEQ ID NO: 1;
- 10 (e) a nucleotide sequence comprising at least 75% sequence identity to the sequence set forth in SEQ ID NO: 3;
- (f) a nucleotide sequence comprising at least 75% sequence identity to the sequence set forth in SEQ ID NO: 5;
- (g) a nucleotide sequence encoding the amino acid sequence set forth in
- 15 SEQ ID NO: 2;
- (h) a nucleotide sequence encoding the amino acid sequence set forth in SEQ ID NO: 4;
- (i) a nucleotide sequence encoding the amino acid sequence set forth in SEQ ID NO: 6;
- 20 (j) a nucleotide sequence that is complementary to the nucleotide sequence of (a), (b), (c), (d), (e), (f), (g), (h), or (i); and
- (k) a nucleotide sequence that hybridizes under stringent conditions to the nucleotide sequence of (a), (b), (c), (d), (e), (f), (g), (h), (i), or (j).

25 2. An expression cassette comprising the nucleotide molecule of claim 1, wherein said nucleotide sequence is operably linked to a promoter that drives expression in a plant cell.

30 3. An isolated protein comprising an amino acid sequence selected from the group consisting of:

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- (a) the amino acid sequence set forth in SEQ ID NO: 2;
  - (b) the amino acid sequence set forth in SEQ ID NO: 4;
  - (c) the amino acid sequence set forth in SEQ ID NO: 6;
  - (d) an amino acid sequence comprising at least 75% sequence identity to the amino acid sequence set forth in SEQ ID NO: 2, wherein said protein comprises pyruvate kinase activity;
  - (e) an amino acid sequence comprising at least 85% sequence identity to the amino acid sequence set forth in SEQ ID NO: 4, wherein said protein comprises pyruvate kinase activity;
  - 10 (f) an amino acid sequence comprising at least 90% sequence identity to the amino acid sequence set forth in SEQ ID NO: 6, wherein said protein comprises pyruvate kinase activity;
  - (g) the amino acid sequence encoded by the nucleotide sequence set forth in SEQ ID NO: 1;
  - 15 (h) the amino acid sequence encoded by the nucleotide sequence set forth in SEQ ID NO: 3; and
  - (i) the amino acid sequence encoded by the nucleotide sequence set forth in SEQ ID NO: 5.

20 4. A transformed plant comprising stably incorporated in its genome a nucleotide construct comprising a nucleotide sequence operably linked to a promoter that drives expression in a plant cell, said nucleotide sequence selected from the group consisting of:

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- (a) the nucleotide sequence set forth in SEQ ID NO: 1;
  - (a) the nucleotide sequence set forth in SEQ ID NO: 3;
  - (b) the nucleotide sequence set forth in SEQ ID NO: 5;
  - (c) a nucleotide sequence comprising at least 70% sequence identity to the sequence set forth in SEQ ID NO: 1;
  - (d) a nucleotide sequence comprising at least 75% sequence identity to the
  - 30 sequence set forth in SEQ ID NO: 3;

- (e) a nucleotide sequence comprising at least 75% sequence identity to the sequence set forth in SEQ ID NO: 5;
- (f) a nucleotide sequence encoding the amino acid sequence set forth in SEQ ID NO: 2;
- 5 (g) a nucleotide sequence encoding the amino acid sequence set forth in SEQ ID NO: 4;
- (h) a nucleotide sequence encoding the amino acid sequence set forth in SEQ ID NO: 6;
- (i) a nucleotide sequence that is complementary to the nucleotide sequence of (a), (b), (c), (d), (e), (f), (g), (h), or (i); and
- 10 (j) a nucleotide sequence that hybridizes under stringent conditions to the nucleotide sequence of (a), (b), (c), (d), (e), (f), (g), (h), (i), or (j).

5. The plant of claim 4, wherein said promoter is selected from the group consisting of tissue-preferred, chemical-regulated, and constitutive promoters.

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6. The plant of claim 5, wherein said tissue-preferred promoter is selected from the group consisting of seed-preferred, embryo-preferred, and endosperm-preferred promoters.

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7. The plant of claim 4, wherein said plant is a monocot.

8. The plant of claim 7, wherein said monocot is selected from the group consisting of maize, wheat, rice, millet, sorghum, barley, and rye.

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9. The plant of claim 4, wherein said plant is a dicot.

10. The plant of claim 9, wherein said dicot is selected from the group consisting of soybean, *Brassica* sp., alfalfa, safflower, sunflower, peanut, cotton, and potato.

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11. Transformed seed of the plant of claim 4.

12. A method for increasing protein in a plant comprising introducing into a  
5 plant a nucleotide construct comprising a nucleotide sequence operably linked to a  
promoter that drives expression in a plant cell, said nucleotide sequence selected from the  
group consisting of:

- (a) the nucleotide sequence set forth in SEQ ID NO: 1;
- (b) the nucleotide sequence set forth in SEQ ID NO: 3;
- 10 (c) the nucleotide sequence set forth in SEQ ID NO: 5;
- (d) a nucleotide sequence comprising at least 70% sequence identity to the  
sequence set forth in SEQ ID NO: 1;
- (e) a nucleotide sequence comprising at least 75% sequence identity to the  
sequence set forth in SEQ ID NO: 3;
- 15 (f) a nucleotide sequence comprising at least 75% sequence identity to the  
sequence set forth in SEQ ID NO: 5;
- (g) a nucleotide sequence encoding the amino acid sequence set forth in  
SEQ ID NO: 2;
- (h) a nucleotide sequence encoding the amino acid sequence set forth in  
20 SEQ ID NO: 4;
- (i) a nucleotide sequence encoding the amino acid sequence set forth in  
SEQ ID NO: 6;
- (j) a nucleotide sequence that is complementary to the nucleotide  
sequence of (a), (b), (c), (d), (e), (f), (g), (h), or (i); and
- 25 (k) a nucleotide sequence that hybridizes under stringent conditions to the  
nucleotide sequence of (a), (b), (c), (d), (e), (f), (g), (h), (i), or (j);

wherein the level of protein is increased in said plant or at least one part thereof.

13. The method of claim 12, wherein said part is a seed or a fruit.

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14. The method of claim 12, wherein said part is an embryo of a seed.

15. The method of claim 12, wherein said part is the endosperm of a seed.

5           16. A method for increasing oil or other desired product in a plant comprising introducing into a plant at least one nucleotide construct comprising a nucleotide sequence operably linked to a promoter that drives expression in a plant cell, wherein said nucleotide sequence is a pyruvate kinase nucleotide sequence or an NADP<sup>+</sup>-dependent malic enzyme nucleotide sequence, and wherein said oil or other  
10 desired product is increased in said plant or at least one part thereof;

                  wherein said nucleotide sequence encoding NADP<sup>+</sup>-dependent malic enzyme is selected from the group consisting of GenBank Accession Nos. J05130, AB016804, AW217913, and AI727829; and

                  wherein said nucleotide sequence encoding pyruvate kinase is selected  
15 from the group consisting of:

- (a) a nucleotide sequence encoding a maize pyruvate kinase;
- (b) a nucleotide sequence encoding a plastidic pyruvate kinase
- (c) the nucleotide sequence set forth in SEQ ID NO: 1;
- (d) a nucleotide sequence comprising at least 70% sequence identity to the  
20 sequence set forth in SEQ ID NO: 1;
- (e) a nucleotide sequence encoding the amino acid sequence set forth in SEQ ID NO: 2;
- (f) a nucleotide sequence encoding an amino acid sequence comprising at least 75% sequence identity to the sequence set forth in SEQ ID  
25 NO: 2;
- (g) a nucleotide sequence that is complementary to the nucleotide sequence of (a), (b), (c), (d), (e), or (f); and
- (h) a nucleotide sequence that hybridizes under stringent conditions to the  
30 nucleotide sequence of (a), (b), (c), (d), (e), (f), or (g).

17. The method of claim 16, wherein said desired product is selected from the group consisting of oil, a triglyceride, an intermediate in oil synthesis, a fatty acid, and a specialty molecule.

5 18. The plant of claim 16, wherein said part is a seed or a fruit.

19. The plant of claim 16, wherein said part is the embryo of a seed.

20. The plant of claim 16, wherein said part is the endosperm of a seed.

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21. A plant genetically manipulated for increased synthesis of oil or other desired product, said plant comprising in its genome:

(a) a first nucleotide construct comprising a  $\text{NADP}^+$ -dependent malic enzyme nucleotide sequence operably linked to a first promoter that drives expression in a plant cell; and

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(b) a second nucleotide construct comprising a pyruvate kinase nucleotide sequence operably linked to a second promoter that drives expression in a plant cell;

wherein the level of said oil or said desired product is increased in said plant or at least one part thereof.

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22. The plant of claim 21, wherein said  $\text{NADP}^+$ -dependent malic enzyme nucleotide sequence is selected from the group consisting of GenBank Accession Nos. J05130, AB016804, AW217913, and AI727829.

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23. The plant of claim 21, wherein said pyruvate kinase nucleotide sequence encoding is selected from the group consisting of:

(a) the nucleotide sequence encoding a maize pyruvate kinase;

(b) the nucleotide sequence encoding a plastidic pyruvate kinase

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(c) the nucleotide sequence set forth in SEQ ID NO: 1;

- (d) a nucleotide sequence comprising at least 70% sequence identity to the sequence set forth in SEQ ID NO: 1;
- (e) a nucleotide sequence encoding the amino acid sequence set forth in SEQ ID NO: 2;
- 5 (f) a nucleotide sequence encoding an amino acid sequence comprising at least 75% sequence identity to the sequence set forth in SEQ ID NO: 2;
- (g) a nucleotide sequence that is complementary to the nucleotide sequence of (a), (b), (c), (d), (e), or (f); and
- 10 (h) a nucleotide sequence that hybridizes under stringent conditions to the nucleotide sequence of (a), (b), (c), (d), (e), (f), or (g).

24. The plant of claim 21, wherein said desired product is selected from the group consisting of oil, a triglyceride, an intermediate in oil synthesis, a fatty acid, and a specialty molecule.

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25. The plant of claim 21, wherein at least one of said first and said second nucleotide constructs further comprises an operably linked nucleotide sequence encoding a plastid transit peptide.

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26. Transformed seed of the plant of claim 21.